

# **Exhibit 3**

# **ADVANCED ORGANIC CHEMISTRY**

**REACTIONS,  
MECHANISMS, AND  
STRUCTURE**

**FOURTH EDITION**

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## 1278 CLASSIFICATION OF REACTIONS BY TYPE OF COMPOUND SYNTHESIZED

## APPENDI

<b>Amino Acids and Esters (continued)</b>	
resulting oxime or nitroso compound	
<b>2-11</b> From acyl halides and a dialkyl azo-dicarboxylate	<b>4-31</b> Reaction between diazonium fluoroborates, CO, and an acid salt
<b>6-5</b> Hydrolysis of cyanohydrins	<b>5-5</b> Addition of carboxylic acids to ketenes
<b>6-16</b> Reaction between aldehydes, ammonia, and carboxylic acids or esters	<b>5-22</b> Free-radical addition of anhydrides to olefins
<b>6-50</b> Addition of cyanide and ammonium ions to aldehydes or ketones, followed by hydrolysis (Strecker)	<b>8-20</b> Reaction between $\alpha$ -diketones and peroxy compounds (Baeyer-Villiger)
<b>8-14</b> Reaction between imides and NaOBr (Hofmann)	<b>9-10</b> Oxidation of aromatic rings
<b>Amino Carbonyl Compounds</b>	<b>Arenes</b>
<b>0-46</b> Amination of $\alpha$ -hydroxy ketones	<b>0-76</b> Reduction of aryl and benzylic halides
<b>0-47</b> Transamination of Mannich bases	<b>0-78</b> Hydrogenolysis of benzyl alcohols
<b>1-36</b> Photolysis of acylated arylamines	<b>0-79</b> Reduction of benzylic ethers
<b>6-16</b> Reaction between aldehydes, ammonia, and aldehydes, ketones, or esters (Mannich)	<b>0-86</b> Coupling of halides containing aryl groups
<b>8-13</b> Rearrangement of ketoxime tosylates (Neber)	<b>0-87</b> Coupling of aryl halides with organometallic reagents
<b>8-22</b> Rearrangement of quaternary ammonium salts (Stevens)	<b>0-98</b> Coupling of benzylic alcohols
<b>9-23</b> Oxidation of certain enamines	<b>1-12</b> Alkylation of aromatic rings (Friedel-Crafts)
<b>Amino Ethers</b>	<b>1-13</b> Arylation of aromatic rings (Scholl)
<b>0-18</b> Alcoholytic of aziridines	<b>1-22</b> Diarylation of ketones
<b>5-39</b> Aminomercuration of alkenes, followed by alcoholysis	<b>1-23</b> Ring closure of aryl-substituted carbonyl compounds
<b>6-16</b> Reaction between aldehydes, amines, and alcohols or phenols (Mannich)	<b>1-37</b> Cleavage or rearrangement of alkyl arenes
<b>Amino Thiols</b>	<b>1-38</b> Decarbonylation of aromatic aldehydes or deacylation of aromatic ketones
<b>0-49</b> Amination of episulfides	<b>1-39</b> Decarboxylation of aromatic acids
<b>1-9</b> Sulfurization of aromatic amines (Herz)	<b>1-41</b> Desulfonation of aromatic sulfonic acids
<b>6-16</b> Reaction between an aldehyde, ammonia, and a thiol (Mannich)	<b>1-42</b> Dehalogenation of aryl halides
<b>Anhydrides</b>	<b>1-44</b> Hydrolysis of organometallic compounds
<b>0-27</b> Reaction of acyl halides with acid salts	<b>2-40</b> Decarboxylation of $\alpha$ -aryl acids
<b>0-28</b> Dehydration of carboxylic acids	<b>2-41</b> Cleavage of tertiary alkoxides
<b>0-33</b> Reaction of acid derivatives with inorganic acids	<b>2-45</b> Cleavage of aryl ketones
<b>3-15</b> From aryl halides and CO	<b>2-46</b> Cleavage of aryl ketones with amide ions (Haller-Bauer)
<b>4-11</b> Acyloxylation of aldehydes	<b>2-48</b> Decyanation of aryl nitriles
	<b>3-9</b> Reduction of phenols, phenolic ethers, or phenolic esters
	<b>3-10</b> Reduction of aromatic nitro compounds
	<b>3-13</b> Coupling of organometallic compounds with aryl halides, ethers, and esters.

Arenes (i)  
**3-16** Cc  
**3-17** Al  
 co  
**4-18** Fn  
 sal  
 Pe  
**4-21** Fr  
**4-22** Ph  
**4-24** Re  
**4-29** Di  
**4-30** M  
**4-33** Cr  
**4-34** Cr  
**4-35** Cr  
 co  
**4-36** Rj  
**4-38** Ci  
 wi  
**4-41** D  
 h  
**5-20** A  
 dr  
**5-51** Ti  
**6-29** A  
 dk  
**7-36** D  
 ta  
**8-30** Pl  
 pl  
**9-1** A  
 ri  
**9-6** O  
**9-33** D  
**9-37** R  
**9-43** R  
 Arly Hs  
**1-11** H  
 p  
**1-35** R  
 (i)  
**1-39** R  
 h  
**1-41** H  
 h  
**1-42** M  
**2-30** F  
 o  
**3-8** A  
 di

2-543.  
ctions of,  
552  
550  
31-533  
, 639  
ion, 810  
of, 549  
554  
zonium  
iction,

37  
.1-420,  
58, 768-  
965  
tutions

98-100  
.1171,  
5, 1198-

523

i, 417-

14  
712  
s, 411  
s and  
1-425  
418-419  
unds,

oxide,

ids,

sters,

.417  
romide,

ounds,

16  
s, 1080-

nds, 835

2  
ides, 499  
560,  
7, 1102

reductive alkylation of, 898-  
900  
in the Strecker synthesis,  
965  
sulfonation of, 528  
thioalkylation of, 551  
transamination of, 415  
in the Ugi reaction, 980  
in the Willgerodt reaction,  
1237  
Aminium radical ions, 527,  
684, 692, 817  
Amino acids:  
conversion:  
to amido ketones, 630-  
631  
to halo acids, 436  
to lactams, 419  
decarboxylation, 629  
formation of, 1277  
protection of, 418, 421  
Amino alcohols, *see*  
Hydroxamines  
Aminoalkylation, 545, 550-  
551  
Amino-de-acyloxy-  
substitution, 418  
Amino-de-alkoxylation, 421  
(3)OC-*seco*-Amino-de-  
alkoxylation, 416  
*S*-Amino-de-chlorination, 499  
Amino-de-halogenation, 411,  
413, 417, 656  
Amino-de-hydrogenation,  
416, 527, 668, 712  
Amino-de-hydroxylation, 414,  
419, 657  
Amino-de-metallation, 616  
2-Amino-1,1-diphenylbutan-1-  
ol, 914  
Amino ethers, 391, 461  
Amino ketones:  
formation of, 1278  
Aminomalononitriles, 966  
Aminomercurials, 770, 832  
Aminonitrenes, 834  
Amino nitriles, *see*  
Cyanonitriles  
Aminophenols, *see*  
Hydroxamines  
Aminopyridines, 466  
Aminosulfonylation, 834  
Amino thioethers, 834  
Amino thiols, formation of,  
1278  
5-Amino-2,4,6-triiodo-  
N,N,N',N'-  
tetramethylisophthalal-  
midic, 162  
Ammonia:  
addition to multiple bonds,  
768-770, 896, 898-903  
in Birch reduction, 781  
bond angles, 6, 22  
inversion of, 98-99  
in the Mannich reaction,  
900-902  
as a nucleophile, 411-412,  
415-421, 656-658, 768-  
770, 896, 898-903, 965  
reaction:  
with acyl halides, 417-418  
with aldehydes, 712, 896,  
907  
with alkyl halides, 411  
with alkyl sulfates and  
sulfonates, 412  
with anhydrides, 418-419  
with carboxylic acids, 419  
with carboxylic esters,  
421, 423-424  
with diazo compounds,  
415, 1083  
with epoxides, 416  
with multiple bonds, 835  
to give NH<sub>3</sub>, 203  
with ozonides, 1177  
with sulfonyl halides, 499  
reductive alkylation of, 898-  
900  
in the Strecker synthesis,  
965  
in the Ugi reaction, 980  
in the Willgerodt reaction,  
1237  
Ammonium chloride, 659,  
907, 965  
Ammonium dihydrogen  
phosphate, 907  
Ammonium formate, 1210,  
1217  
Ammonium nitrate, 1169  
Ammonium peroxydisulfate,  
720, 1188-1189  
Ammonium polysulfide, 1237  
Ammonium sulfide, 1216  
AM1 method, 28  
A<sub>N</sub>A<sub>B</sub> mechanism, 737  
A<sub>N</sub> + A<sub>B</sub> mechanism, 741  
A<sub>N</sub> + A<sub>N</sub> mechanism, 741  
Anchimeric assistance, 309,  
314-318, 320-325, 1055-  
1056, 1060, 1119  
in free radical reactions,  
682  
A<sub>n</sub> + cyclo-D<sub>n</sub>A<sub>B</sub>D<sub>n</sub>  
mechanism, 573  
A<sub>n</sub>D<sub>n</sub>D<sub>n</sub> mechanism, 983  
A<sub>n</sub>D<sub>n</sub> + D<sub>n</sub> mechanism, 991  
A<sub>n</sub>D<sub>n</sub> mechanism, 294  
3/1/A<sub>n</sub>D<sub>n</sub> mechanism, 329  
A<sub>n</sub> + D<sub>n</sub> mechanism, 331,  
642  
Angular methyl group,  
oxidation of, 1154  
Anhydrides:  
addition to multiple bonds,  
807  
bisdecarboxylation of, 1187  
condensation with  
aldehydes, 954  
conversion:  
to acyl azides, 429  
to acyl fluorides, 438  
to amides, 418-419  
to carboxylic esters, 392-  
393  
to imides, 419, 427  
to mixed anhydrides, 405  
to peroxides, 403  
to thiol acids and ester,  
409  
disproportionation of, 401  
formation of, 1278  
halogenation of, 590  
in hydroacylation, 806  
hydrolysis of, 377  
reaction:  
with active hydrogen  
compounds, 490, 491  
with aldehydes and  
ketones, 491, 890, 971  
with alkenes, 599  
with amino acids, 630-631  
with aromatic rings, 540-  
541  
with enamines, 602  
with organometallic  
compounds, 488-489,  
932  
with phosphoranes, 962-  
963  
with SF<sub>4</sub>, 909  
with sulfoxides, 1236  
reduction of, 448, 1213-  
1215  
Aniline, 270  
Anionic cleavage, 592, 593,  
626-633, 761  
1,3-Anionic cycloadditions,  
834  
Anionotropic rearrangements,  
1051  
Anisole, 525  
Annellation, 44, 46, 60  
Annual Reviews, 1253-1254  
Annulenes, 51-66  
[18] Annulene, 714  
Anodic oxidations, 703, 712  
Anomeric effect, 147  
Antarafacial reactions, 851,  
857-858, 875, 960,  
1031, 1122-1125, 1127  
Anthracenes, 37, 43, 1192  
Anthraquinone, 1192